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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/723,392  
Filing Date: November 26, 2003  
Appellant(s): BRUYNESTEYN, ALBERT

**MAILED  
DEC 20 2007  
GROUP 1700**

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John G. Posa  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed September 27, 2007 appealing from the Office action mailed May 25, 2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The amendment after final rejection filed on September 27, 2007 has been entered.

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows: Claims 2,12-14 are rejected under 35 USC 112, first paragraph.

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. Claims 1-5,7,9-14 under 35 USC 112, second paragraph.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,387,239	DUYVESTEYN	5-2002
H2005 H	WINBY	11-2001

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 2,12-14 are rejected under 35 USC 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter with was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention.

In claim 2, "is added to the leaching heap ... below about 2.4" is new matter.

The limitations in each of claims 12-14 are new matter.

Claims 1-5,7,9-14 are rejected under 35 USC 103(a) as being unpatentable over Duyvesteyn '239 in view of Winby H2005H.

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Duyvesteyn teaches the instantly claimed process of combining elemental sulfur with *Thiobacillus thiooxidans* and *Thiobacillus ferrooxidans* to form a solution, ie. is wetted, that is applied to a metal containing ore to form agglomerates for heap leaching the ore to release or extract metal values from the ore. See cols. 4,8.

Duyvesteyn may differ in that the elemental sulfur being finely ground is not stated.

Winby teaches a similar bioleaching process in a heap to recover metal values in which milled or ground elemental sulfur is used. See cols. 2-5.

It would have been obvious to one skilled in the art to use milled or ground elemental sulfur in the process of Duyvesteyn because each is drawn to a similar process of heap bioleaching metal containing ore using sulfur and because it is well known in the art that grinding solids to smaller sizes provides greater surface area with which the solids can participate in reactions. The examiner takes Official notice that the dependent claims are drawn to process particulars which are well known in the art and therefore obvious to one skilled in the art.

The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to select the portion of the prior art's range which is within the range of applicant's claims because it has been held to be obvious to select a value in a known range by optimization for the best results, see *In re Boesch*, 205 USPQ 215.

#### **(10) Response to Argument**

Applicant argues that instant pg. 6, lines 12-16 supports the pH range of "below about 2.4" in instant claim 2 because it is within the range of 1.8-2.4.

However instant pg. 6, lines 12-16 only supports a pH range of 1.8-2.4. Instantly claimed "below about 2.4" would include pH values such as 0 or 1.1, which are outside the instantly disclosed pH range of 1.8-2.4, and therefore is unsupported and new matter.

Applicant argues that instant pg. 6, lines 4-9 supports "at least 12 hours" in instant claim 12 because it falls into the range of 12-48.

However instant pg. 6, lines 4-9 only supports "12-48 hours." Instantly claimed "at least 12 hours" would include times such as 60 or 160 hours, which are outside the instantly disclosed time of 12-48 hours, and therefore is unsupported and new matter.

Applicant argues that instant pg. 3, lines 4-10 supports "the acid bioleach solutions produced in the reactor are added to the leaching heap."

However nowhere in instant pg. 3, lines 4-10 is "the acid bioleach solutions produced in the reactor are added to the leaching heap" disclosed or implied because it never discloses that acid bioleach solutions are produced in a reactor nor that such solutions are added to a leaching heap.

Applicant argues that all of the limitations of claim 14 have been discussed above and may be found at least in the Summary of the Invention.

However instant pg. 6, lines 4-9 only supports "12-48 hours." Instantly claimed "at least 12 hours" would include times such as 60 or 160 hours, which are outside the instantly disclosed time of 12-48 hours, and therefore is unsupported and new matter.

Also, nowhere in instant pg. 3, lines 4-10 is "adding the acidic bioleach solutions to the leaching heap" disclosed or implied because it never discloses that acidic bioleach solutions are produced nor that such solutions are added to a leaching heap.

Applicant argues that the step of preconditioning of the sulfur particles with bacteria before addition to a leaching heap containing the ore is neither disclosed nor suggested in either Duyvesteyn or Winby.

However this is taught or at least suggested by Duyvesteyn at col. 2, lines 55-65, col. 3, lines 7-19, col. 4, lines 4-6, col. 7, lines 9-21, col. 8, lines 1-9 and claim 23 wherein the taught sulfur containing compound is elemental sulfur (see col. 4, lines 31-34). It is also taught or at least suggested in Winby at col. 3, lines 14-19 and col. 4, lines 60-63 wherein the taught second material is elemental sulfur (see col. 3, lines 22,23 and col. 2, lines 35-40).

Appellant argues that Duyvesteyn does not disclose or suggest that the sulfur particles become wetted and the bacteria attach themselves to the sulfur surfaces before addition to the leaching heap.

However this is taught or at least suggested at col. 4, lines 22-30 and 64,65, and col. 8, lines 1-3 because the combination of sulfur and bacteria mixed with an aqueous solution or an aqueous nutrient solution would "wet" the sulfur. With regard to the bacteria being attached to the sulfur this is at least suggested by example 1 where "inoculum that had been grown on elemental sulfur" is taught. It is noted that "inoculum" is synonymous with bacteria or microorganism. Furthermore the taught combination of sulfur and bacteria mixed with aqueous solution or aqueous nutrient solution would

serve to "wet" the sulfur particles so that the mixture of bacteria therein would attach to the sulfur. It is further noted that Winby also suggests such "wetted" sulfur at col. 4, lines 60-64 wherein the sulfur would be wetted by water when it is brought in contact with same.

Appellant argues that the instant specification shows that preconditioning greatly speeds release of metal values from low sulfur content ores in the leaching heap as shown by the instant Figs. 2,3 and 4.

However this showing is not commensurate in scope with the instant claims which do not require the process particulars shown in the "Test Results" starting on instant pp. 7-9(referring to Figs. 2,3 and 4) which state that column 10 had both *Thiobacillus thiooxidans* and *Thiobacillus ferrooxidans* added and that improved extraction is due mainly to *Thiobacillus ferrooxidans* assisting in the sulfur oxidation process. None of the instant claims require both *Thiobacillus thiooxidans* and *Thiobacillus ferrooxidans*.

It is noted that instant pg. 7, lines 21,22 states that *Thiobacillus ferrooxidans* is not known as an elemental sulfur oxidizer. However this is contrary to the teaching of Duyvesteyn at col. 4, lines 54-58, which states "the sulfur selective microorganism is an oxidizing bacterium that is capable of oxidizing sulfur. Non-limiting examples of suitable bacteria include those selected from the group consisting of *Thiobacillus thiooxidans*, *Thiobacillus ferrooxidans*, ... and mixtures thereof."



Appellant argues that there is no disclosure or suggestion of "adding *Thiobacillus ferrooxidans* to the leaching heap when the pH of the acidic bioleach solution at the bottom of the heap falls between 2.4."

However Duyvesteyn teaches maintaining a pH range of about 1.5 to about 3 by adding sulfur selective microorganisms, ie. *Thiobacillus ferrooxidans*, in col. 5, lines 5-8, which overlaps that instantly claimed and thus would have been obvious. Furthermore, it is noted that appellants argument is not commensurate in scope with instant claim 2 which requires a pH range of "below about 2.4."

Appellant argues that the examiner notes that the references do not disclose producing ground sulfur by rod milling as in instant claim 3.

However rod milling is just another well known method of grinding; Winby teaches milling sulfur per se and no unexpected results have been shown by rod milling to produce ground sulfur.

Appellant argues that instant claim 4 adds specific limitations to the definition of finely ground sulfur as produced by rod milling which are not disclosed in the references.

However no unexpected results have been shown by rod milling to produce ground sulfur having the specific limitations.

Appellant argues that instant claim 5 adds a bacteria nutrient to the finely ground sulfur during their preconditioning with bacteria and the cited references do not disclose any preconditioning process to wet the sulfur particles, allowing the bacteria to attach to the sulfur surfaces before adding the wetted sulfur particles to the leaching heap.

However as explained above the cited prior art does suggest if not teach wetting the sulfur as well as attaching the bacteria to the sulfur. Furthermore adding nutrient to bacteria is well known in the art as shown by Duyvesteyn at col. 4, lines 64-67.

Appellant argues that preconditioning the finely ground sulfur with bacteria for 12-48 hours is not disclosed or suggested by the cited prior art.

However this is an art recognized result-effective parameter which would have been obvious to optimize to that which provides the best results.

Appellant argues that claim 9 adds the limitation that acid bioleach solution produced during the preconditioning is added to leach solution reservoir associated with the leaching heap to partially satisfy the acidic demand of the ore which is not taught or suggested by either of the references.

However Duyvesteyn suggests same at col. 7, lines 52-55, where microorganism solution, ie. bioleach or sulfuric acid solution, is collected at the bottom and recycled to the top of the heap.

Appellant argues that the cited references do not disclose the step of controlling the pH in the leaching heap in the range of 1.8 to 2.4 to speed the oxidization of metallic sulfites.

However Duyvesteyn teaches maintaining a pH range of about 1.5 to about 3 by adding sulfur selective microorganisms, ie. *Thiobacillus ferrooxidans*, in col. 5, lines 5-8, which overlaps that instantly claimed and thus would have been obvious. Furthermore, it is noted that appellants argument is not commensurate in scope with instant claim 10 which requires "metal sulphides" not "metallic sulfites."

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Appellant argues that the bacteria comprising *Thiobacillus thiooxidans* recited in instant claim 11 is not taught nor suggested by the cited prior art.

However Duyvesteyn teaches *Thiobacillus thiooxidans* at col. 4, lines 54-57.

Appellant argues that instant claim 12 adds the limitation of preconditioning for at least 12 hours.

However this is an art recognized result-effective parameter which would have been obvious to optimize to that which provides the best results.

Appellant argues that instant claim 13 adds the limitation that the acidic bioleach solutions produced in the reactor are added to the leaching step with is neither taught nor suggested by the cited art.

However Duyvesteyn suggests same at col. 7, lines 52-55, where microorganism solution, ie. bioleach or sulfuric acid solution, is collected at the bottom and recycled to the top of the heap.

Appellant argues that instant claim 14 emphasizes the two step nature of the present process where the elemental sulfur is preconditioned in a reactor for at least 12 hours to produce acidic bioleach solutions before agglomerating the preconditioned sulfur particles in the leaching heap and adding the acidic bioleach solution to the leaching heap to partially satisfy the acid demand of the ore, none of which are disclosed in the cited references.

However each of these arguments have been responded to above and are hereby incorporated by reference.

**(11) Related Proceeding(s) Appendix**

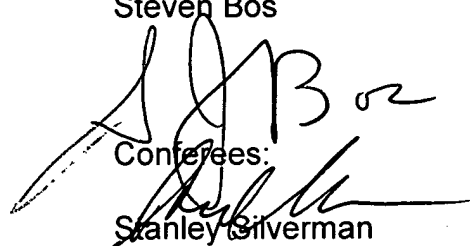
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No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,


Steven Bos

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Conferees:

A handwritten signature in black ink, appearing to read 'Stanley Silverman', with a long horizontal stroke extending to the right.  
Stanley Silverman

Kathryn Gorgos

A handwritten signature in black ink, appearing to read 'Kathryn Gorgos', with a long horizontal stroke extending to the right.